



(12) **United States Patent**
Hashimoto

(10) **Patent No.:** **US 9,146,697 B2**
(45) **Date of Patent:** **Sep. 29, 2015**

(54) **SYSTEM, METHOD, AND TERMINAL DEVICE FOR PROVIDING MULTIPLE SERVICES BY USING ONE OR MORE ELECTRONIC DEVICES**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/194,951**

(22) Filed: **Mar. 3, 2014**

(65) **Prior Publication Data**

US 2014/0253939 A1 Sep. 11, 2014

(30) **Foreign Application Priority Data**

Mar. 6, 2013 (JP) 2013-043889
Feb. 21, 2014 (JP) 2014-031706

(51) **Int. Cl.**
G06F 3/12 (2006.01)
H04N 1/00 (2006.01)

(52) **U.S. Cl.**
CPC **G06F 3/1206** (2013.01); **G06F 3/1204** (2013.01); **G06F 3/1232** (2013.01); **G06F 3/1247** (2013.01); **G06F 3/1285** (2013.01); **G06F 3/1292** (2013.01); **H04N 1/00** (2013.01)

(58) **Field of Classification Search**
CPC G06F 3/1204; G06F 3/1292
USPC 358/1.13, 1.14, 1.15, 1.1; 709/229, 203; 348/744, E9.025; 705/51

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

8,488,170	B2	7/2013	Takata
2002/0063693	A1	5/2002	Aoki et al.
2005/0235077	A1	10/2005	Kubota
2007/0216943	A1 *	9/2007	Funamizu 358/1.15
2011/0085196	A1 *	4/2011	Liu et al. 358/1.15
2011/0096354	A1 *	4/2011	Liu 358/1.15
2013/0250358	A1	9/2013	Suzuki
2014/0016161	A1	1/2014	Yamada
2014/0016816	A1 *	1/2014	Yamada 382/100
2014/0019499	A1	1/2014	Arai
2014/0019859	A1	1/2014	Hashimoto

FOREIGN PATENT DOCUMENTS

JP	2005-292903	10/2005
JP	2007-026466	2/2007
JP	2011-129054	6/2011
JP	2014-016896	1/2014
JP	2014-016897	1/2014
JP	2014-016898	1/2014
JP	2014-016899	1/2014

* cited by examiner

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(57) **ABSTRACT**

A system for providing multiple services by using one or more electronic devices connected to the system includes a data processing apparatus, a portable terminal including an obtaining unit that obtains device data from a target electronic device included in the one or more electronic devices, the device data identifying the one or more electronic devices, a receiving part that receives a selection of a target service included in the multiple services, and a determining part that determines whether the target service can be executed by the target electronic device according to the device data obtained from the target electronic device. In a case where the determining part determines that the target service can be executed by the target electronic device, the portable terminal and the data processing apparatus cooperate with each other and control the target electronic device for providing the target service.

9 Claims, 19 Drawing Sheets

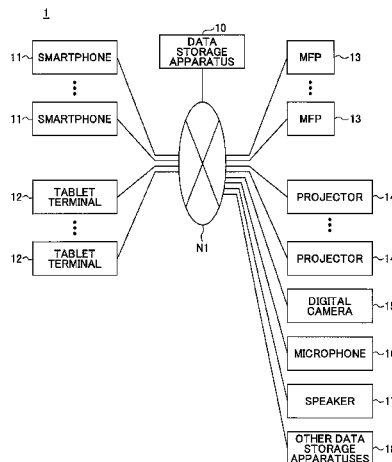


FIG.1

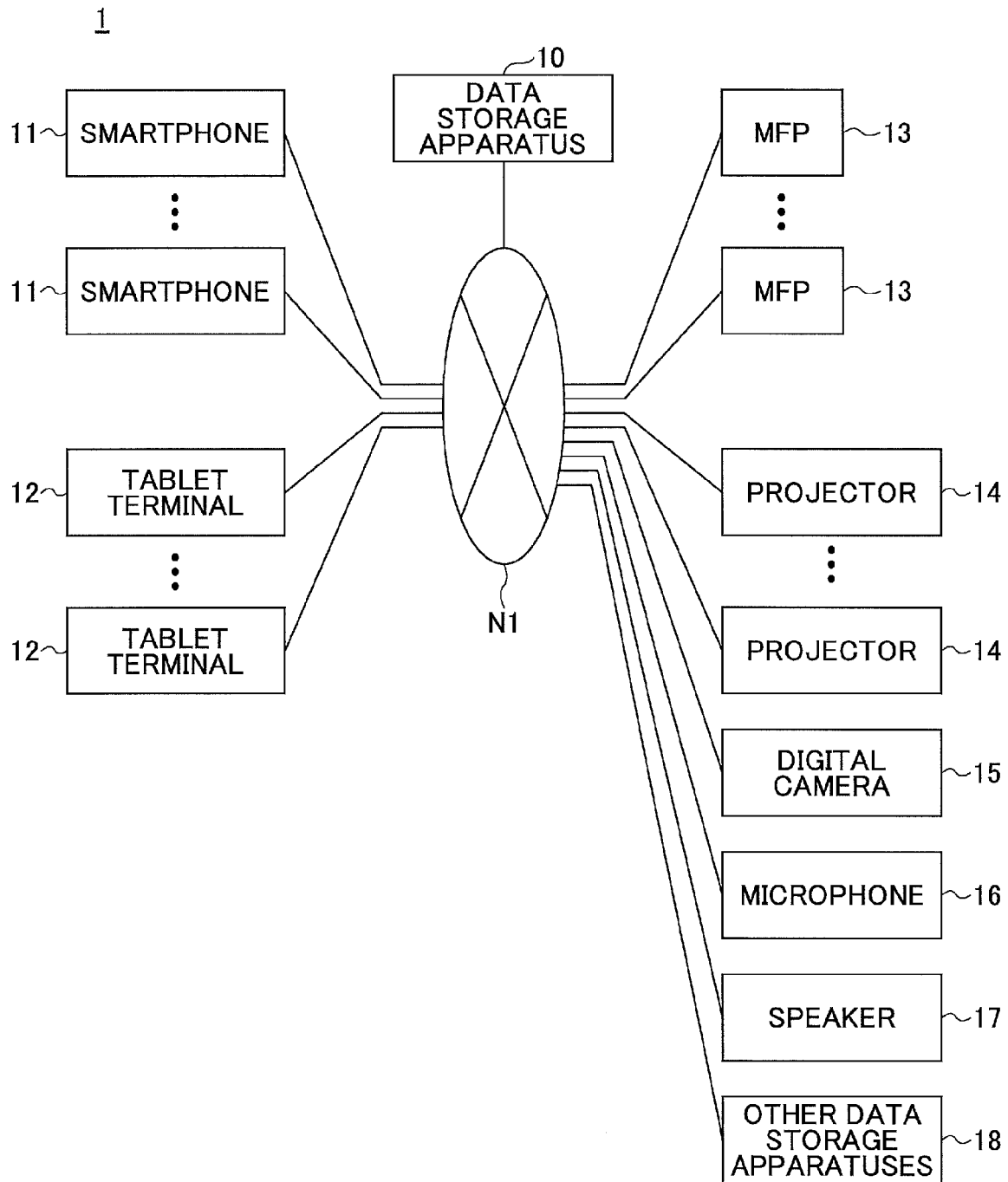


FIG.2

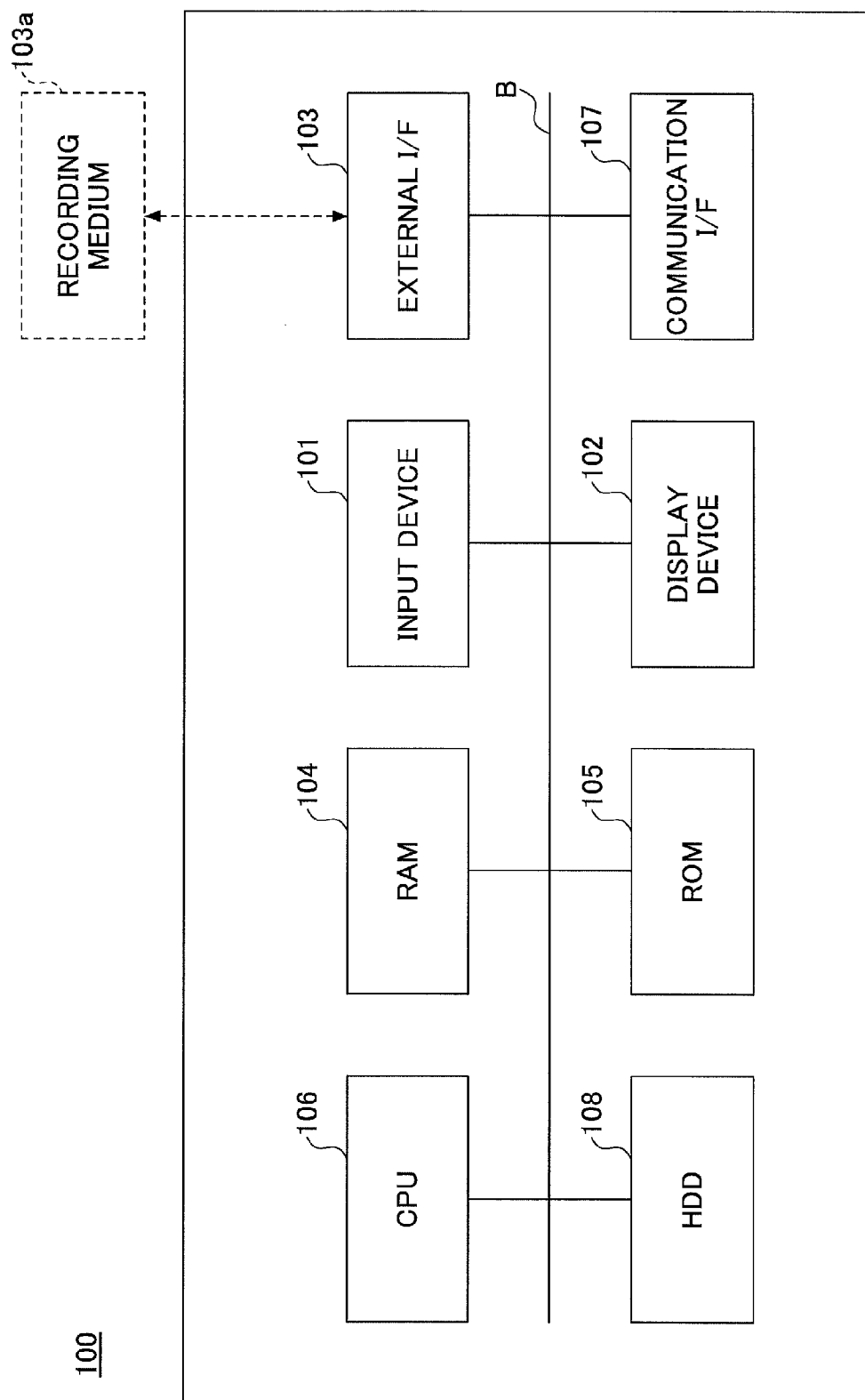


FIG.3

400

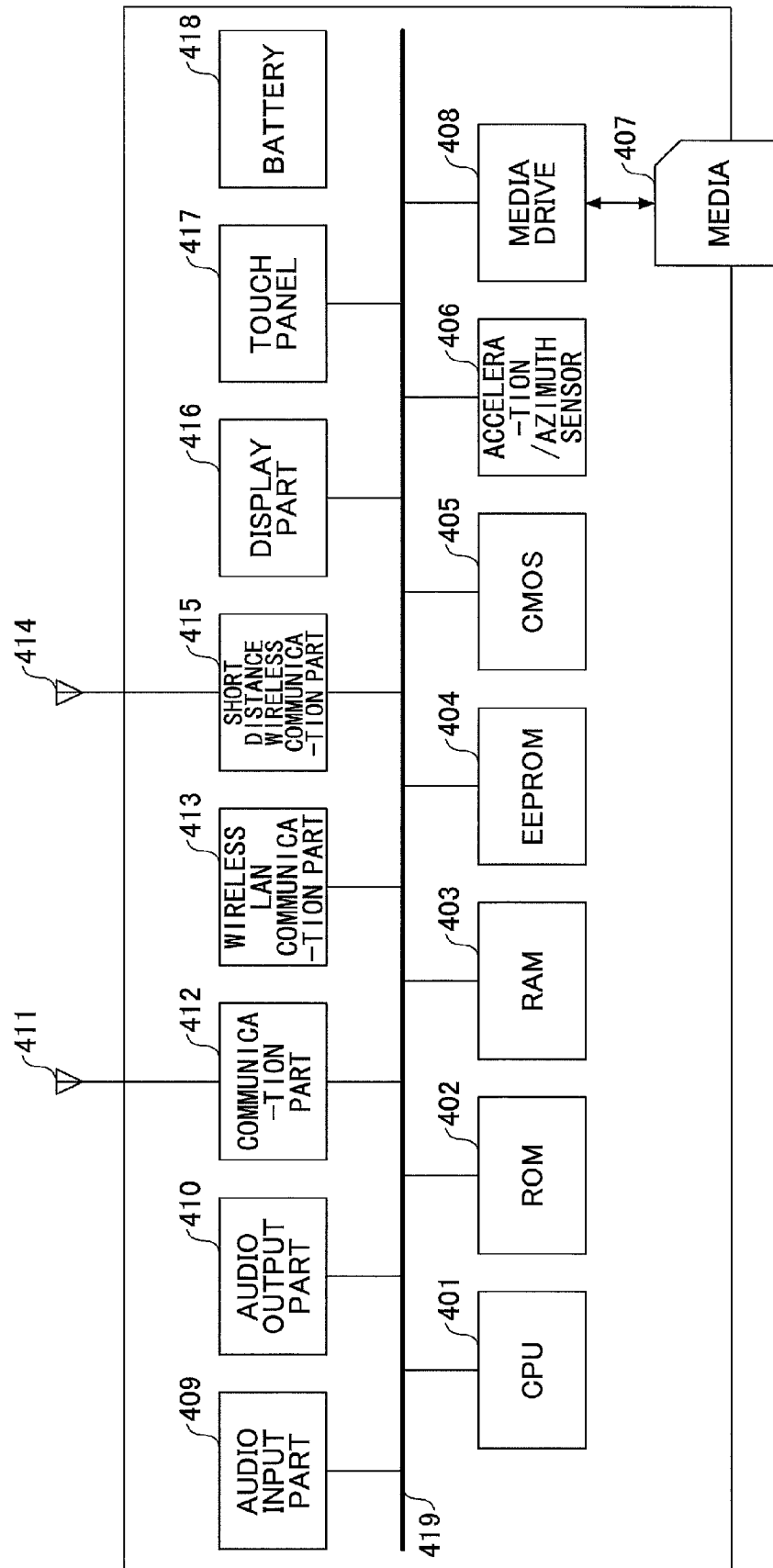


FIG.4

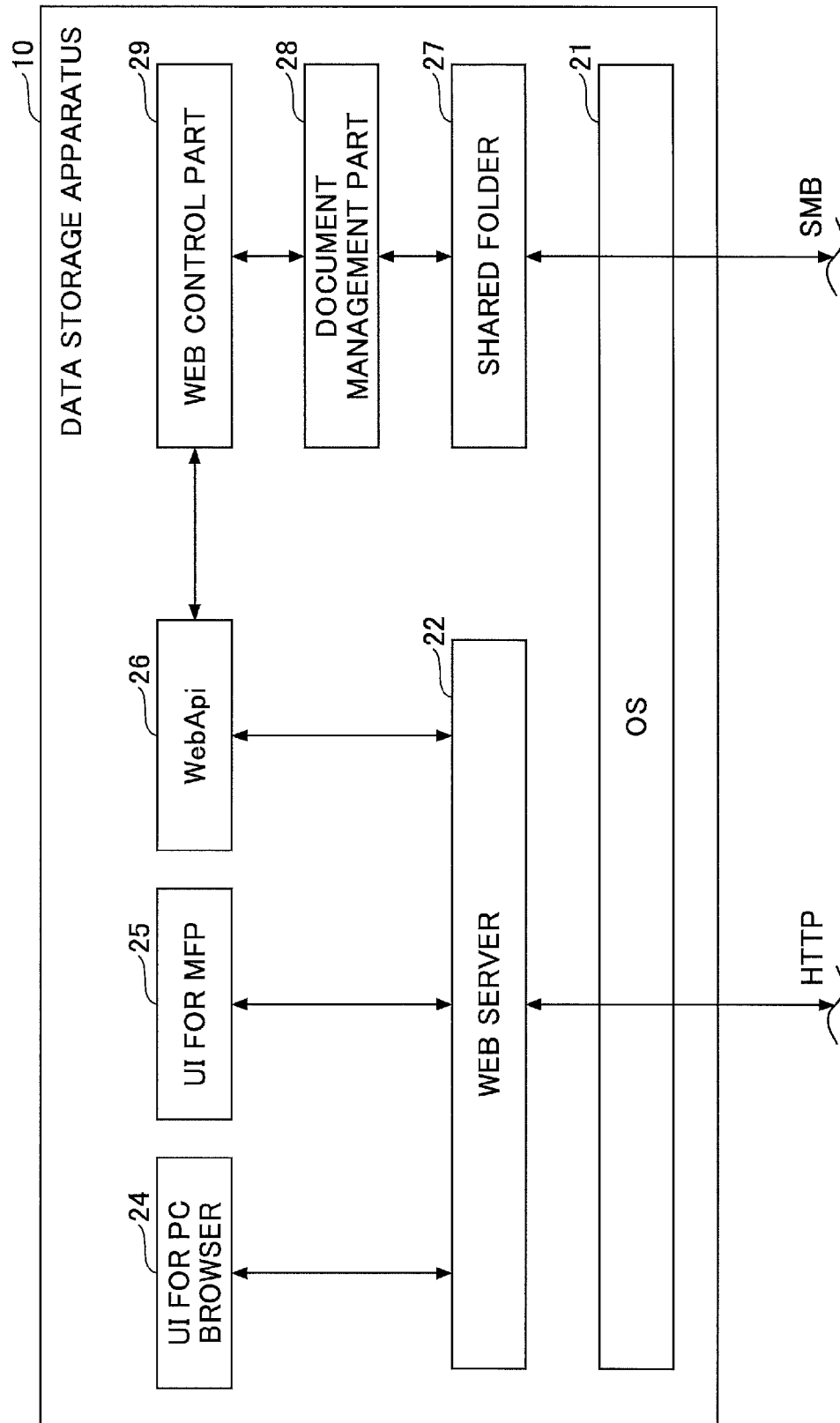


FIG.5

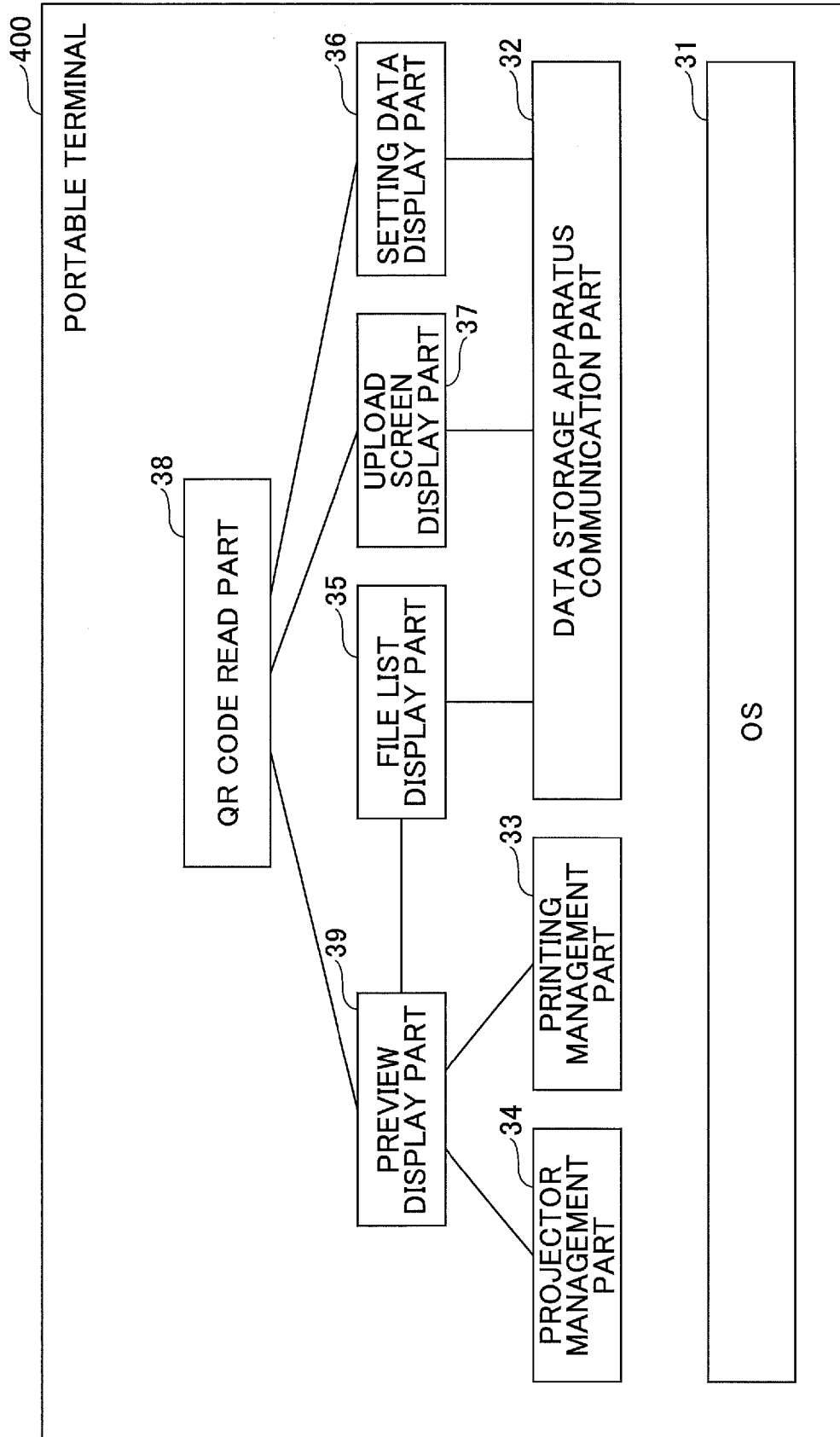


FIG. 6

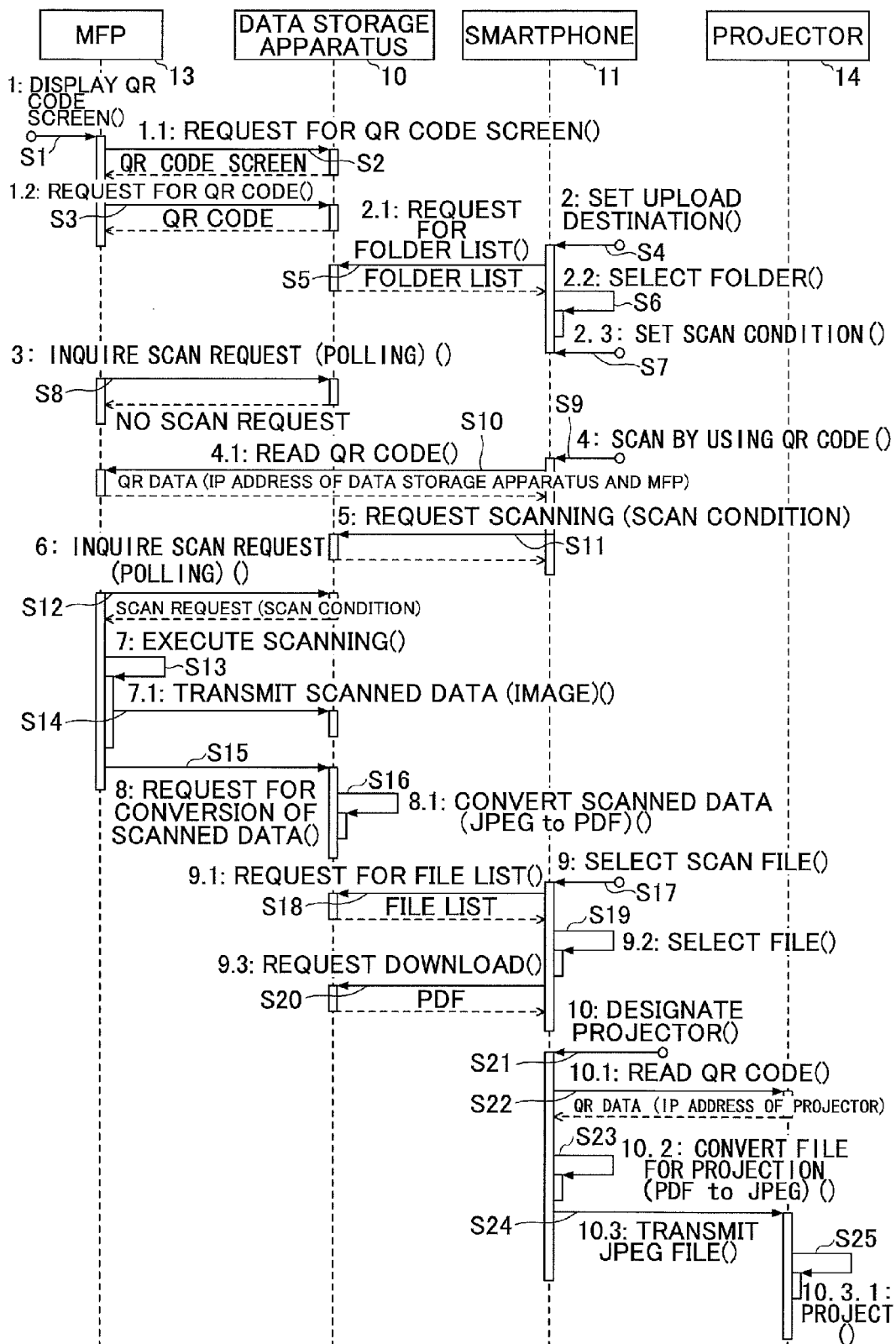


FIG. 7



CANCEL		UPLOAD	
SELECT FOLDER OF UPLOAD DESTINATION			
 /docs/Data		1001	
READ AND UPLOAD WITH MFP			
SET SCANNING		1002	
DESIGNATE MFP WITH QR CODE		1003	
TAKE PICTURE AND UPLOAD WITH CAMERA			
TAKE PICTURE WITH CAMERA		>	
SELECT FROM ALBUM AND UPLOAD			
		CAMERA ROLL (55)	
		>	

FIG.8





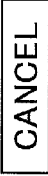
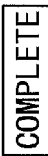
SELECT FOLDER	
	Data
<div> test XXXX/XX/XX XX:XX:XX</div>	>
<div> NEW FOLDER XXXX/XX/XX XX:XX:XX</div>	>
<div> DOCUMENT XXXX/XX/XX XX:XX:XX</div>	>
NUMBER OF FOLDERS :3	
	

FIG. 9

SCAN SETTINGS		COMPLETE
DOCUMENT TYPE	TEXT/PHOTO (FULL COLOR) >	
RESOLUTION	300dpi >	
DOCUMENT SIDE	SINGLE-SIDE DOCUMENT >	
DOCUMENT SET DIRECTION	AUTOMATIC DETERMINATION >	
BLANK PAPER REMOVAL	YES >	
DOCUMENT SET POSITION	AUTOMATIC DETECTION >	
FILE FORMAT	PDF >	
DOUBLE-SIDE DOCUMENT	LAST PAGE	DOUBLE-SIDE >

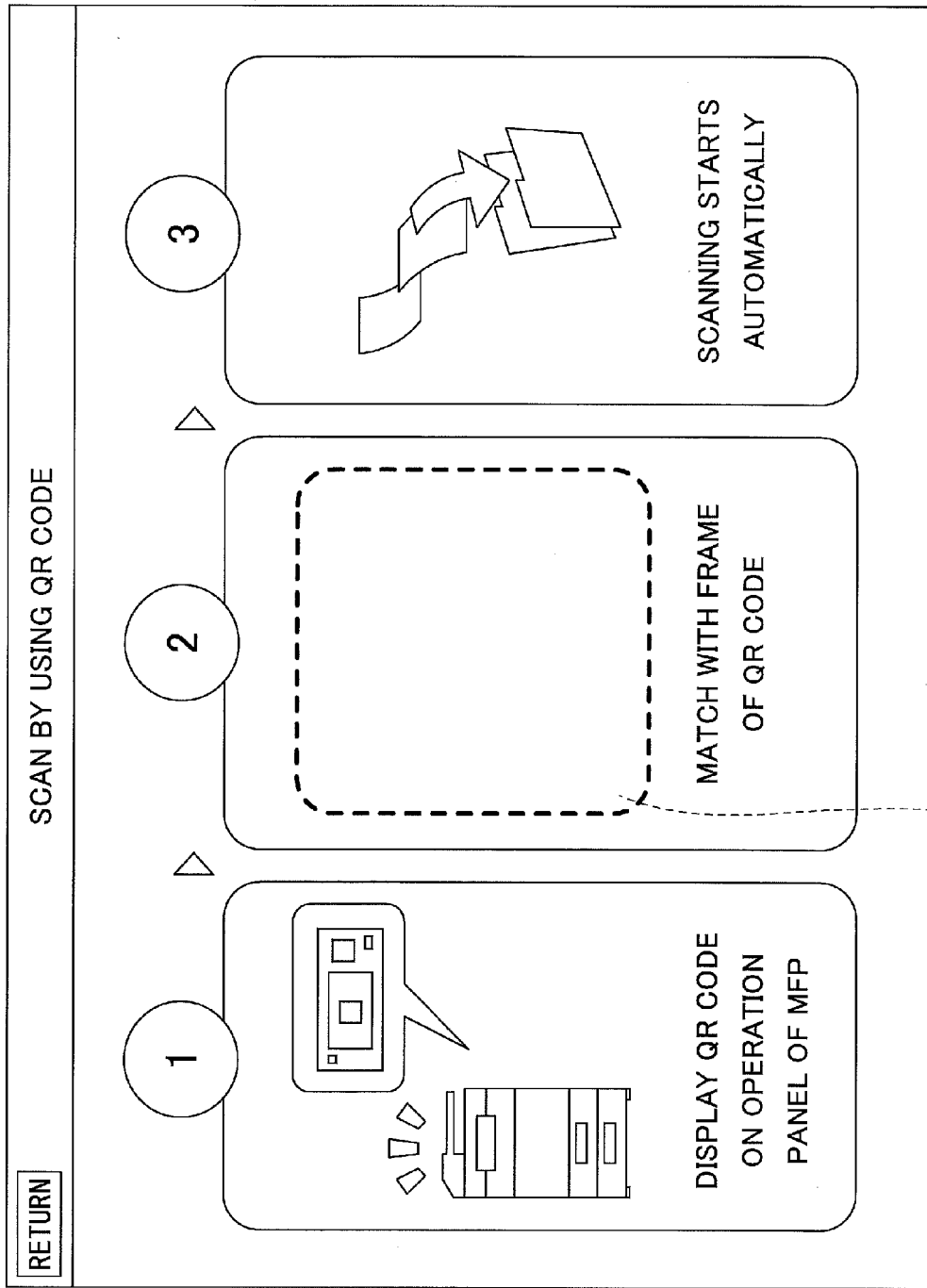


FIG.10

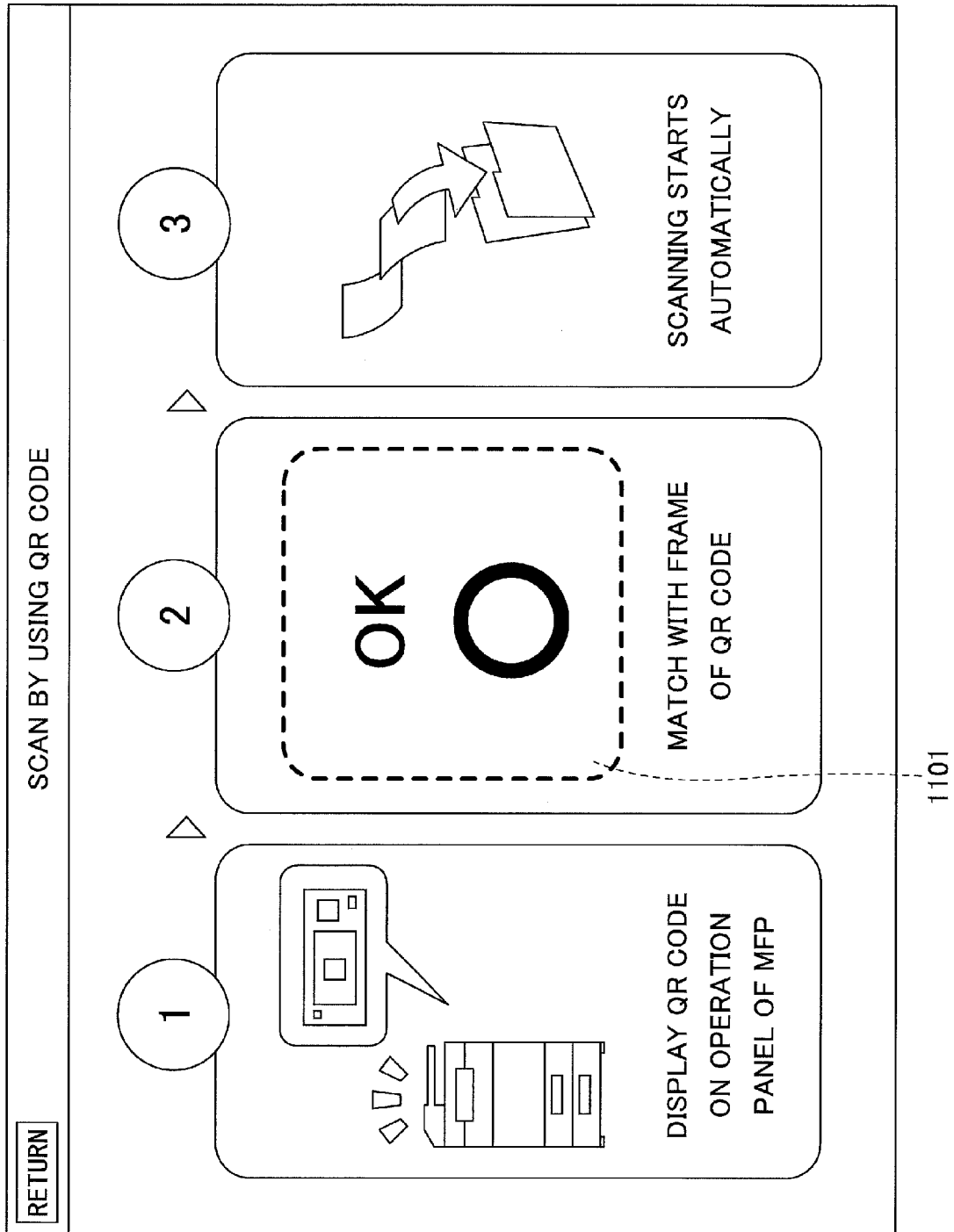


FIG.11

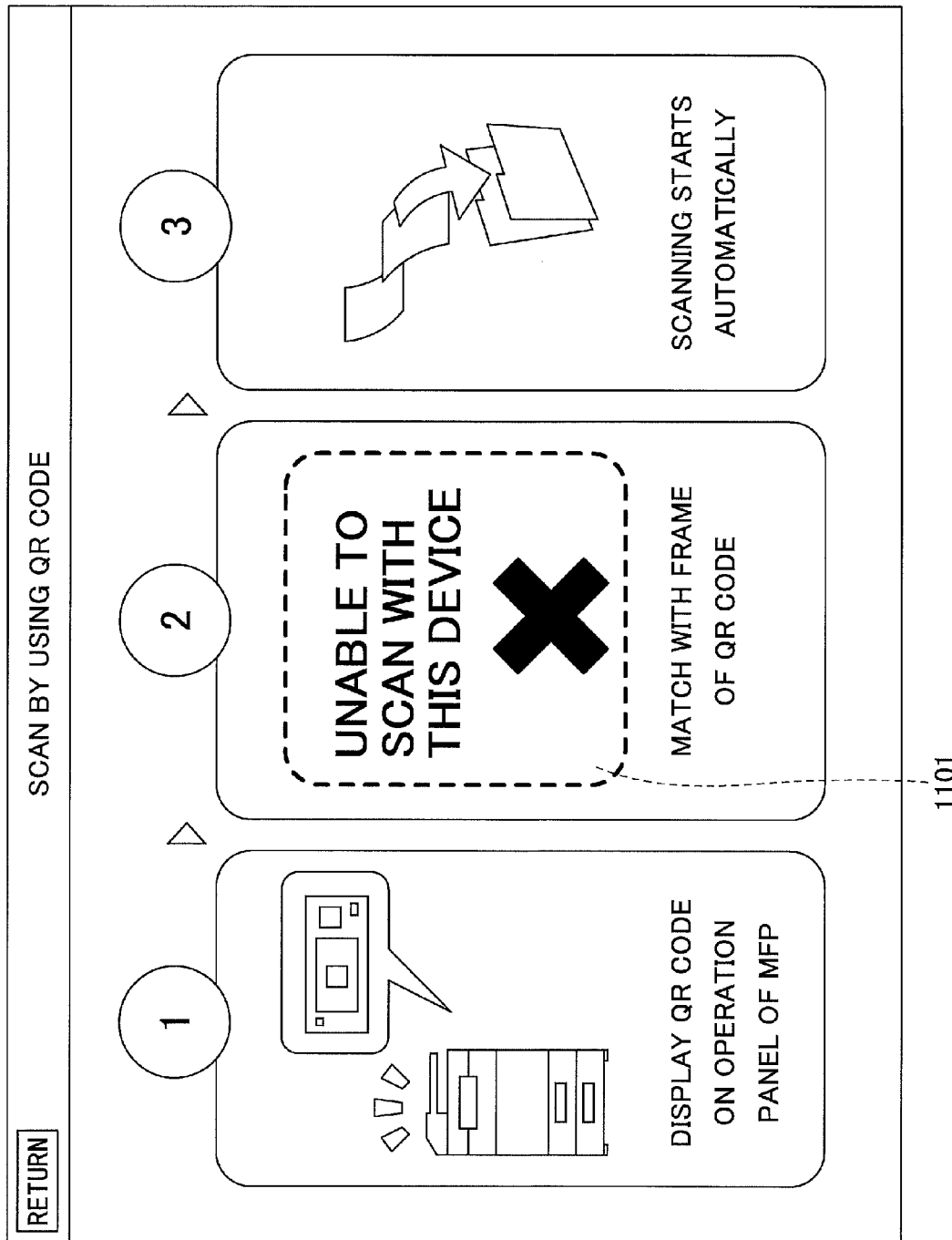


FIG.12

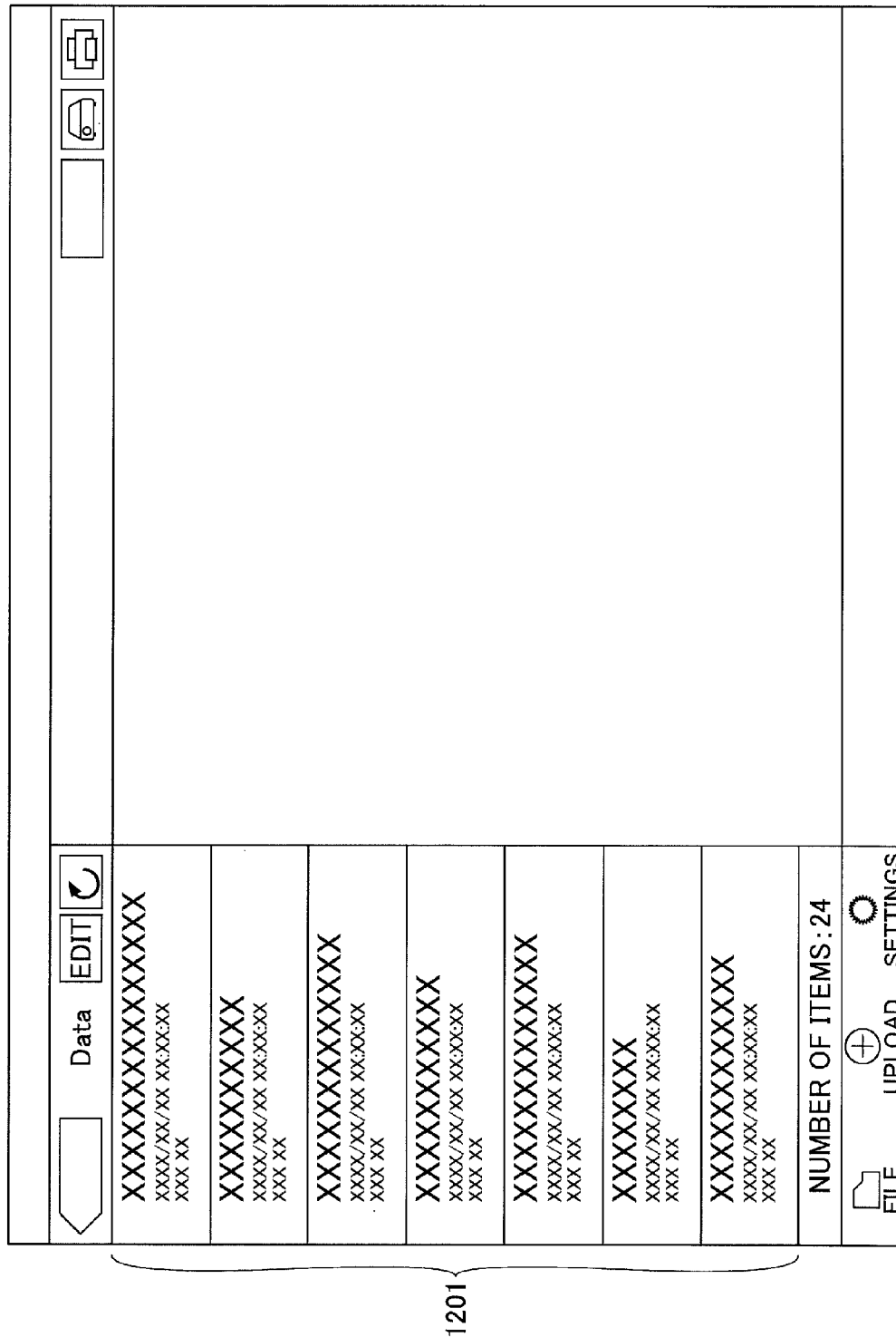


FIG. 13

<div> <div> </div> <div> <div>Data</div> <div>EDIT</div> <div></div> </div> </div>		<div> <div>SAMPLE.ppt</div> <div> </div> </div>	
<div> XXXXXXXXXXXXXXXXXXXX XXXX/XX/XX XXXXXXXX XXX XX </div>		<div> <div> <div>SELECT PROJECTOR FROM LIST</div> <div>DESIGNATE PROJECTOR BY USING QR CODE</div> <div>OPEN BY USING FOLLOWING METHOD</div> </div> <div>1211</div> <div>SAMPLE</div> <div>1/1</div> </div>	
<div> XXXXXXXXXXXX XXXX/XX/XX XXXXXXXX XXX XX </div>			
<div> XXXXXXXXXXXXXXXXXXXX XXXX/XX/XX XXXXXXXX XXX XX </div>			
<div> XXXXXXXXXXXX XXXX/XX/XX XXXXXXXX XXX XX </div>			
<div> XXXXXXXXXXXXXXXXXXXX XXXX/XX/XX XXXXXXXX XXX XX </div>			
<div> XXXXXXXXXXXX XXXX/XX/XX XXXXXXXX XXX XX </div>			
<div> XXXXXXXXXXXXXXXXXXXX XXXX/XX/XX XXXXXXXX XXX XX </div>			
<div> <div>NUMBER OF ITEMS: 24</div> <div> <div>FILE</div> <div> <div>+</div> <div>UPLOAD</div> <div>SETTINGS</div> </div> </div> </div>			

FIG.14

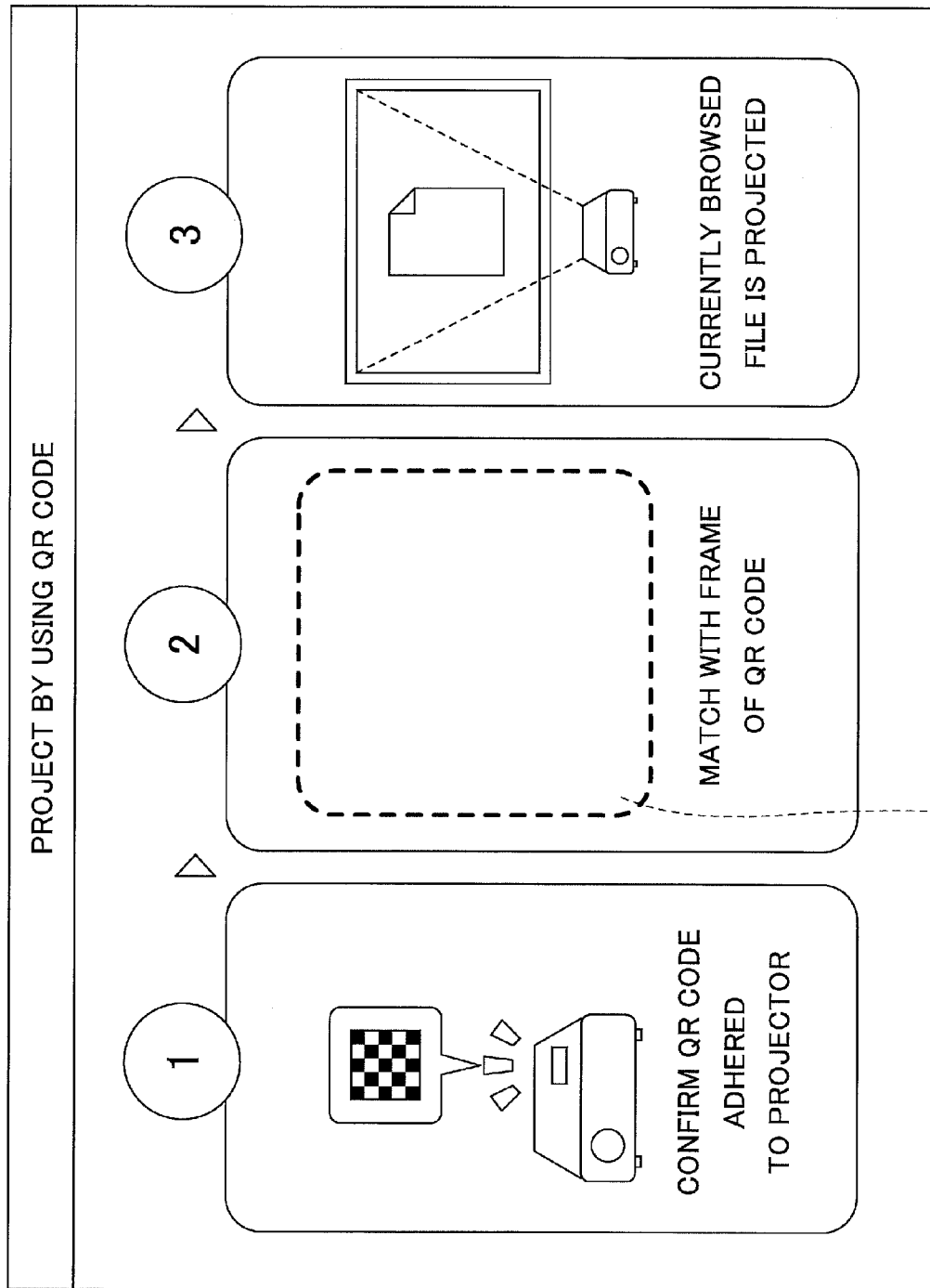
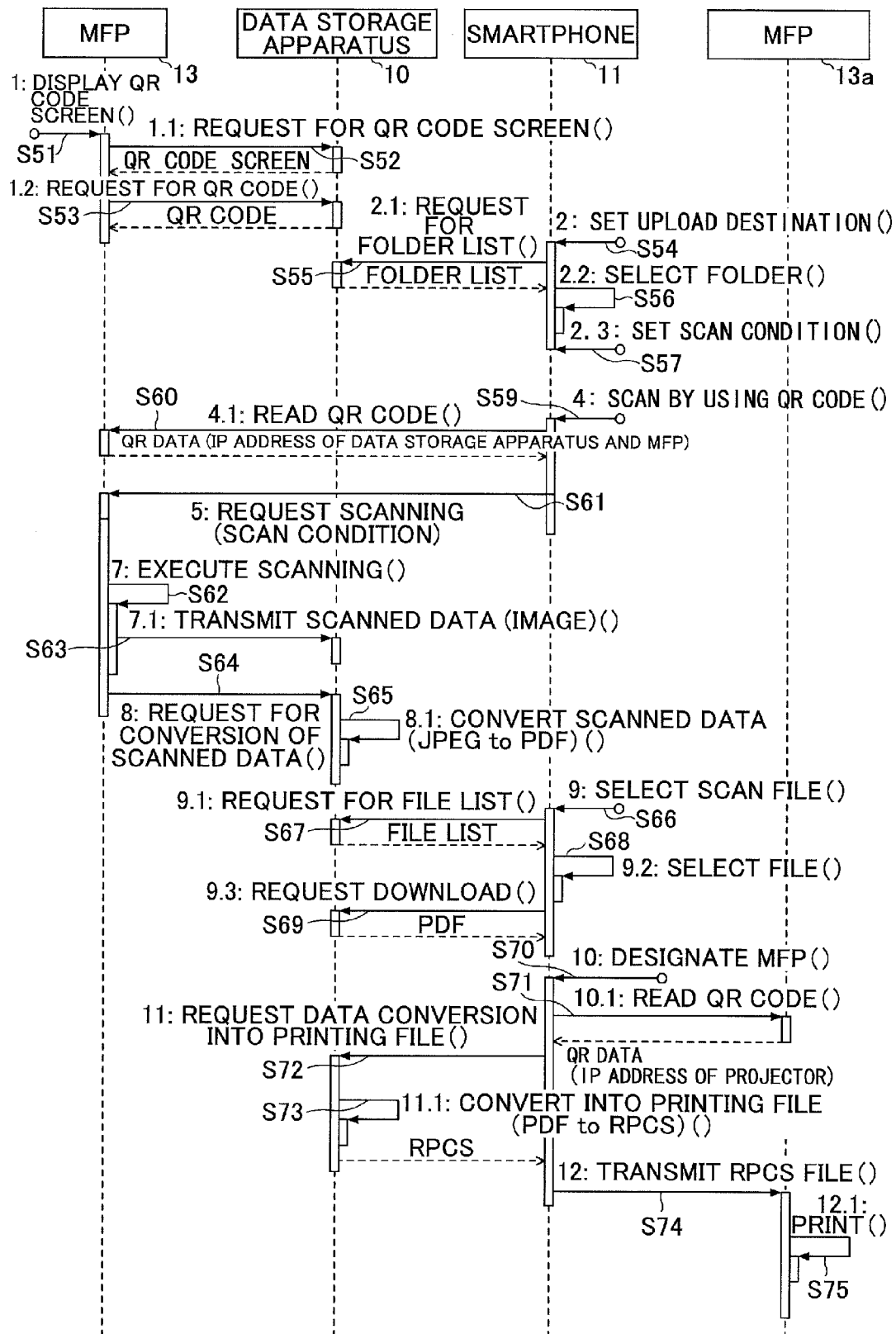


FIG.15

FIG. 16



<div>DATA EDIT </div>		<div>SAMPLE.ppt </div>	
XXXXXXXXXXXXXXXXXXXX XXXX/XX/XX XXXXXXXX XXX XX		<div>PRINTING SETTINGS</div> <div>SELECT PRINTER FROM LIST</div> <div>DESIGNATE PRINTER BY USING QR CODE</div> <div>SAMPLE</div> <div>1/1</div>	
XXXXXXXXXXXX XXXX/XX/XX XXXXXXXX XXX XX			
XXXXXXXXXXXXXXXXXXXX XXXX/XX/XX XXXXXXXX XXX XX			
XXXXXXXXXXXX XXXX/XX/XX XXXXXXXX XXX XX			
XXXXXXXXXXXX XXXX/XX/XX XXXXXXXX XXX XX			
XXXXXXXXXXXXXXXXXXXX XXXX/XX/XX XXXXXXXX XXX XX			
NUMBER OF ITEMS: 24			
<div>FILE </div>		SETTINGS	

FIG.17

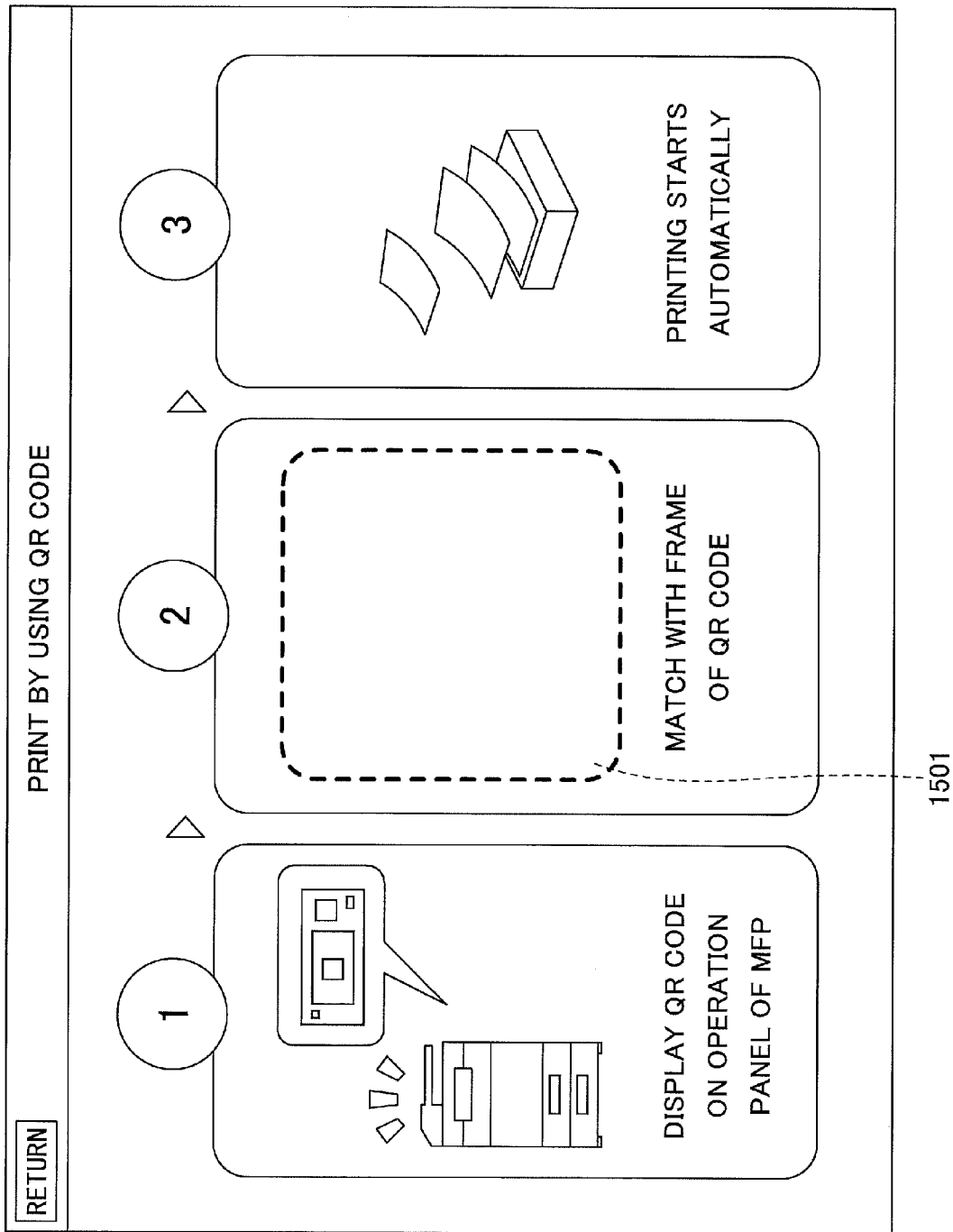
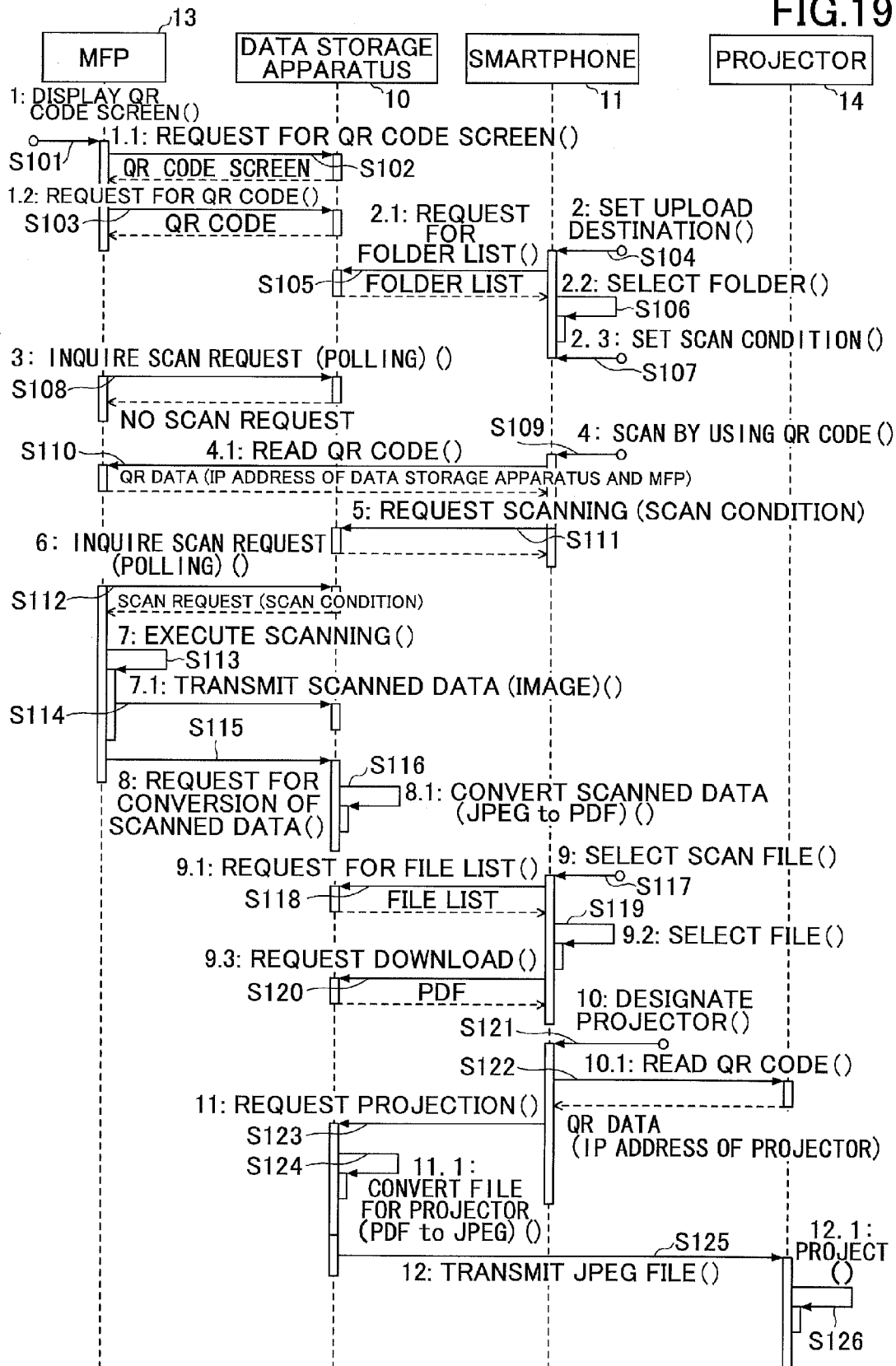


FIG.18

FIG. 19



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SYSTEM, METHOD, AND TERMINAL DEVICE FOR PROVIDING MULTIPLE SERVICES BY USING ONE OR MORE ELECTRONIC DEVICES

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a system, a method, and a terminal device for providing one or more services.

2. Description of the Related Art

In a case of instructing a printer to print data stored in a file server, there may be a problem in which the printer is unable to print the data due to insufficient defining of data conversion between the printer and the file server. For example, Japanese Laid-Open Patent Application No. 2005-292903 teaches a control system for solving this problem.

In recent years, a user uses various units of electronic equipment for outputting electronic data (e.g., printer, multi-function machine, projector) and various terminal devices (e.g., mobile phone, smartphone, tablet terminal). The value of a system that utilizes the electronic equipment and terminal devices is expected to increase the more the electronic equipment and the terminal devices are used cooperatively.

However, with the conventional system that utilizes the electronic equipment and the terminal devices, there is no mechanism that allows multiple services to be provided by using one or more units of electronic equipment among the multiple units of electronic equipment connected to the system.

SUMMARY OF THE INVENTION

The present invention may provide a system, a method, and a terminal device for providing a service that substantially obviate one or more of the problems caused by the limitations and disadvantages of the related art.

Features and advantages of the present invention are set forth in the description which follows, and in part will become apparent from the description and the accompanying drawings, or may be learned by practice of the invention according to the teachings provided in the description. Objects as well as other features and advantages of the present invention will be realized and attained by a system, a method, and a terminal device for providing a service particularly pointed out in the specification in such full, clear, concise, and exact terms as to enable a person having ordinary skill in the art to practice the invention.

To achieve these and other advantages and in accordance with the purpose of the invention, as embodied and broadly described herein, an embodiment of the present invention provides a service providing system for providing multiple services by using one or more electronic devices connected to the service providing system, the system including a data processing apparatus, a portable terminal including an obtaining unit configured to obtain device data from a target electronic device included in the one or more electronic devices, the device data identifying the one or more electronic devices, a receiving part configured to receive a selection of a target service included in the multiple services, and a determining part configured to determine whether the target service can be executed by the target electronic device according to the device data obtained from the target electronic device. In a case where the determining part determines that the target service can be executed by the target electronic device, the portable terminal and the data processing apparatus are con-

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figured to cooperate with each other and control the target electronic device for providing the target service.

Other objects, features and advantages of the present invention will become more apparent from the following detailed description when read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic diagram illustrating a configuration of an input/output system according to an embodiment of the present invention;

FIG. 2 is a schematic diagram illustrating an example of a hardware configuration of a computer system according to an embodiment of the present invention;

FIG. 3 is a schematic diagram illustrating an example of a hardware configuration of a portable terminal according to an embodiment of the present invention;

FIG. 4 is a block diagram illustrating process parts of a data storage apparatus according to an embodiment of the present invention;

FIG. 5 is a block diagram illustrating process parts of a portable terminal according to an embodiment of the present invention;

FIG. 6 is a sequence diagram illustrating processes performed by an input/output system according to an embodiment of the present invention;

FIG. 7 is a schematic diagram illustrating an example of an upload screen;

FIG. 8 is a schematic diagram illustrating an example of a folder selection screen;

FIG. 9 is a schematic diagram illustrating an example of a scan setting screen;

FIG. 10 is a schematic diagram illustrating an example of a QR code read screen;

FIG. 11 is a schematic diagram illustrating an example of a QR code read screen in a case where an MFP has a scanning function;

FIG. 12 is a schematic diagram illustrating an example of the QR code read screen in a case where an MFP does not have a scanning function;

FIG. 13 is a schematic diagram illustrating an example of a main screen;

FIG. 14 is a schematic diagram illustrating an example of a preview displayed on a main screen;

FIG. 15 is a schematic diagram illustrating another example of a QR code read screen;

FIG. 16 is a sequence diagram illustrating processes performed by an input/output system according to another embodiment of the present invention;

FIG. 17 is a schematic diagram illustrating another example of a main screen;

FIG. 18 is a schematic diagram illustrating another example of a QR code read screen; and

FIG. 19 is a sequence diagram illustrating processes performed by an input/output system according to yet another embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 is a schematic diagram illustrating a configuration of an input/output system 1 according to an embodiment of the present invention. The input/output system 1 includes a data storage apparatus 10 connected to a network N1 such as a LAN (Local Area Network). The input/output system 1 also includes one or more smartphones 11 and one or more tablet

terminals **12** connected to the network **N1**. Further, the input/output system **1** also includes one or more MFPs (Multi-Function Peripherals) **13** and one or more projectors **14** connected to the network **N1**. Further, the input/output system **1** may also include a digital camera **15**, a microphone **16**, a speaker **17**, and other data storage apparatuses **18** connected to the network **N1**. The input/output system **1** is one example of a service providing system.

The network **N1** may use a network in a private environment such as a network inside a company. The smartphone **11** and the tablet terminal **12** are examples of a portable terminal **400** carried and operated by a user. Besides the smartphone **11** and the tablet terminal **12**, the portable terminal **400** may also be, for example, a mobile phone or a laptop PC (Personal Computer) as long as it is a device that can be carried and operated by a user.

The MFP **13** and the projector **14** are examples of electronic equipment (electronic apparatuses) that perform input/output of electronic data (e.g., printing, scanning, projecting). Further, the digital camera **15**, the microphone **16**, and the speaker **17** are also examples of the electronic equipment that perform input/output of electronic data. Besides the MFP **13** and the projector **14**, the electronic equipment may also be, for example, a printer, a scanner, a copier, and an image display apparatus as long as it is an apparatus that performs input/output of electronic data.

The MFP **13** is an example of an image forming apparatus. The MFP **13** includes, for example, an imaging function, an image forming function, and a communicating function. Thus, the MFP **13** may be used as, for example, a printer, a facsimile machine, a scanner, and a copier. The MFP **13** also includes a Web browser function. Accordingly, the MFP **13** plots (depicts) HTML data stored in the data storage device and displays the plotted data on an UI (User Interface). Further, the MFP **13** allows a Javascript (Registered Trademark) program to operate on the UI. Thereby, the UI can receive requests such as printing requests or scanning requests from the user. The projector **14** is an example of an image projection apparatus. The projector **14** includes, for example, a projecting function and a communicating function.

The data storage apparatus **10** is an example of a data process apparatus. The data storage apparatus **10** can perform high function processes that cannot be performed by the MFP **13** or the projector **14**. The data storage apparatus **10** also performs processes of a file server. It is to be noted that the data storage apparatus **10** cooperates with the terminal devices (e.g., smartphone **11**, tablet terminal **12**) and performs input/output of electronic data by way of the electronic equipment (e.g., MFP **13**, projector **14**). It is to be noted that the data storage apparatus **10** may be constituted of multiple independent (separate) computers.

<Hardware Configuration>

For example, the data storage apparatus **10** may be implemented by a computer system having a hardware configuration illustrated in FIG. 2. It is to be noted that terminal devices such as the smartphone **11** and the tablet terminal **12** also have a hardware configuration illustrated in FIG. 2. FIG. 2 is a schematic diagram illustrating an example of a hardware configuration of a computer system **100** according to an embodiment of the present invention.

The computer system **100** of FIG. 2 includes, for example, an input device **101**, a display device **102**, an external I/F **103**, a RAM (Random Access Memory) **104**, a ROM (Read Only Memory) **105**, a CPU (Central Processing Unit) **106**, a communication I/F (interface) **107**, and a HDD (Hard Disk Drive) **108** that are connected to each other by a bus **B**. The input

device **101** includes, for example, a keyboard and a mouse. The input device **101** is used for inputting operation signals to the computer system **100**.

The display device **102** includes, for example, a display. The display device **102** displays process results of the computer system **100**. The communication I/F **107** is an interface that connects the computer system **100** to the network **N1**. Accordingly, the computer system **100** can perform data communications with, for example, other portable terminals **400** and electronic devices via the communication I/F **107**.

The HDD **108** is a non-volatile storage apparatus that stores, for example, programs and data therein. The programs and data stored in the HDD **108** include, for example, basic software for controlling the entire computer system **100** (e.g., Operating System (OS)) and application software for providing various functions by way of the OS. Further, the HDD **108** manages its stored programs and data by using a predetermined file system and/or a database (DB).

The external I/F **103** is an interface for, for example, an external apparatus provided outside the computer system **100**. The external apparatus may be, for example, a recording medium **103a**. Accordingly, the computer system **100** can read/write data from/to the recording medium **103a** via the external I/F **103**. It is to be noted that the recording medium **103a** includes, for example, a flexible disk, a CD (Compact Disk), a DVD (Digital Versatile Disk), an SD (Secure Digital) memory card, and a USB (Universal Serial Bus) memory.

The ROM **105** is a non-volatile semiconductor memory (storage device) that can maintain programs and data stored therein even when not powered. The ROM **105** stores programs/data pertaining to BIOS (Basic Input/Output System) that is executed when activating the computer system **100**, programs/data pertaining to OS settings, and programs/data pertaining to network settings therein.

The CPU **106** is a processor (arithmetic unit) that implements the entire controls and functions of the computer system **100** by reading out programs and data from storage devices (e.g., ROM **105**, HDD **108**), loading the programs and data into the RAM **104**, and executing various processes according to the programs and data.

With the above-described embodiment of the hardware configuration of the computer system **100**, the computer system **100** can implement the various processes described below.

<Portable Terminal>

FIG. 3 is a schematic diagram illustrating an example of a hardware configuration of a portable terminal **400** according to an embodiment of the present invention. The portable terminal **400** of FIG. 3 includes, for example, a CPU **401**, a ROM **402**, a RAM **403**, an EEPROM (Electrically Erasable Read Only Memory) **404**, a CMOS sensor **405**, an acceleration/azimuth sensor **406**, and a media drive **408**.

The CPU **401** controls the entire operations of the portable terminal **400**. The ROM **402** stores basic input/output programs therein. The RAM **403** is used as a work area of the CPU **401**. The EEPROM **404** reads out and writes data according to the controls of the CPU **401**. The CMOS sensor **405** images an object and obtains image data of the object. The acceleration/azimuth sensor **406** includes, for example, an electromagnetic compass or a gyrocompass that detects terrestrial magnetism or an acceleration sensor. The media drive **408** controls reading/writing (storing) of data with respect to various recording media **407** such as flash memory. The recording media **407** may be detachably attached to the media drive **408**, so that data recorded in the recording media **407** can be read from the recording media **407** and/or new data can be written (stored) into the recording media **407**.

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It is to be noted that the EEPROM **404** stores, for example, association data used for network settings and OS data executed by the CPU **401**. In this embodiment, an application used for executing a cooperation service (hereinafter also referred to as "cooperation application") is stored in the EEPROM **404** or the recording media **407**.

Further, the CMOS sensor **405** is not limited to a CMOS sensor but may be other types of sensors such as a CCD (Charge Coupled Device) sensor as long as the sensor can convert light into electric charges for digitizing an image of an object.

Further, the portable terminal **400** includes, for example, an audio input part **409**, an audio output part **410**, an antenna **411**, a communication part **412**, a wireless LAN communication part **413**, a short distance wireless communication antenna **414**, a short distance wireless communication part **415**, a display part **416**, a touch panel **417**, and a bus line **419**.

The audio input part **409** converts sound into audio signals. The audio output part **410** converts audio signals into sound. The communication part **412** transmits/receives wireless signals with a nearest base station by using the antenna **411**. The wireless LAN communication part **413** performs short distance wireless communications (e.g., Bluetooth (registered trademark) communications) by using the short distance wireless communication antenna **414**.

The display part **416** may be, for example, a liquid crystal display or an organic electro-luminescence display. The display part **416** may display, for example, an image of an object and various icons. The touch panel **417** may be, for example, a pressure sensitive panel or an electrostatic type panel arranged on the display part **416**. The touch panel **417** detects a location (touch position) on the display part **416** in accordance with a touch by a finger, a pen, or the like. The bus line **419** may be, for example, an address bus or a data bus for electrically connecting the aforementioned parts and components of the portable terminal **400**.

Further, the portable terminal **400** also includes a battery **418** dedicated for the portable terminal **400**. The portable terminal **400** is driven by the battery **418**. It is to be noted that the audio input part **409** includes a microphone into which sound is input. The audio output part **410** includes a speaker from which sound is output.

With the above-described embodiment of the hardware configuration of the portable terminal **400**, the portable terminal **400** can implement the various processes described below.

<Software Configuration>

<<Data Storage Apparatus>>

The data storage apparatus **10** according to an embodiment of the present invention is implemented with, for example, the process parts illustrated in the block diagram of FIG. 4. FIG. 4 is a block diagram illustrating process parts of the data storage apparatus **10** according to an embodiment of the present invention. The data storage apparatus **10** executes a program(s) to implement the processes of an OS **21**, a Web server **22**, a UI for a PC browser (PC browser UI) **24**, a UI for an MFP (MFP UI) **25**, a Web API (Application Programming Interface) **26**, a shared folder **27**, a document management part **28**, and a Web control part **29** by way of a processor.

The OS **21** is an operating system of the data storage apparatus **10**. The OS **21** controls the entire system of the data storage apparatus **10**. The OS **21** may be, for example, Windows (registered trademark) or Linux (registered trademark).

The Web server **22** is software that transmits/receives data by using HTTP (Hyper Text Transfer Protocol). The Web

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server **22** may be, for example, Apache Tomcat (registered trademark) or IIS (Internet Information Services, registered trademark).

The PC browser UI **24** displays a system setting screen on a portable terminal **400** in accordance with an HTTP request. The user uses a Web browser (not illustrated) to perform changes of settings by way of the system setting screen.

The MFP UI **25** displays a code data screen on an electronic device such as the MFP **13** in accordance with an HTTP request. An example of the code data displayed on the code data screen is a QR code (registered trademark). The QR code is a matrix-type two-dimensional code. Further, the MFP UI **25** also displays, for example, a printing screen or a scanning screen in accordance with a HTTP request. The user uses a Web browser function of the MFP **13** to instruct, for example, the MFP **13** to perform a printing process or a scanning process.

The Web API **26** can be used via the network **N1**. The Web API **26** receives (accepts) an HTTP request, performs a process corresponding to the HTTP request, and transmits an HTTP response. The Web API **26** also generates a QR code.

The Web API **26** is an interface that is predefined for receiving a request from a portable terminal **400** such as the smartphone **11** and the tablet terminal **12**. The Web API **26** is constituted by, for example, functions and classes.

Further, the Web API **26** of the data storage apparatus **10** can be provided to a developer of an application installed in a portable terminal **400** as a SDK (Software Development Kit). The developer of the application can develop an application by using the SDK. The SDK may also be provided to an entity (third party vendor) other than the provider of the data storage apparatus **10**. Accordingly, the third party vendor can develop an application by using the SDK. The application developed by using the SDK can be installed in a portable terminal **400**.

By providing the Web API **26** of the data storage apparatus **10** as an SDK, not only an application developed by a provider of the data storage apparatus **10** can be installed in a portable terminal **400** but also an application developed by a third party vendor or the like can be installed in the portable terminal **400**.

The shared folder **27** is a folder that is made available on the network **N1** by using a SMB (Server Message Block) protocol. The user can access the shared folder by using a portable terminal **400** such as the smartphone **11** or the tablet terminal **12**.

The document management part **28** manages a file placed in the shared folder **27** and performs a data conversion process in accordance with a request from the Web control part **29**. In this embodiment, a file is one form of electronic data. The Web control part **29** controls the document management part **28** in accordance with a request from the Web API **26**.

The processes performed by the data storage apparatus **10** can be further divided into two processes. The first process includes the processes performed by the Web server **22**, the PC browser UI **24**, the MFP UI **25**, and the Web API **26**. The second process includes the processes performed by the shared folder **27**, the document management part **28**, and the Web control part **29**. Accordingly, the Web API **26** and the Web control part **29** exchange (communicate) processes with each other.

<<Portable Terminal>>

The portable terminal **400** according to an embodiment of the present invention is implemented with, for example, the process parts illustrated in the block diagram of FIG. 5. FIG. 5 is a block diagram illustrating process parts of the portable terminal **400** according to an embodiment of the present invention. The portable terminal **400** executes a program(s) to

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implement the processes of an OS 31, a data storage apparatus communication part 32, a printing management part 33, a projector management part 34, a file list display part 35, a setting data display part 36, an upload screen display part 37, a QR code read part 38, and a preview display part 39 by way of a processor.

The OS 31 is an operating system of the portable terminal 400. The OS 31 controls the entire system of the portable terminal 400. The OS 31 may be, for example, iOS (registered trademark) or Android (registered trademark).

The data storage apparatus communication part 32 transmits/receives data with respect to the Web API 26 of the data storage apparatus 10 by using HTTP. Further, the data storage apparatus communication part 32 accesses the shared folder 27 of the data storage apparatus 10 by using SMB.

For example, the file list display part 35, the setting data display part 36, and the upload screen display part 37 use the data storage apparatus communication part 32 to obtain data such as electronic data from the data storage apparatus 10 or to request the data storage apparatus 10 to perform a predetermined process.

For example, the file list display part 35 displays a list of files in the data storage apparatus 10 and receives (accepts) a selection of a file by the user. For example, the setting data display part 36 performs settings for communicating with the data storage apparatus 10 and displays setting data of the portable terminal 400. For example, the upload screen display part 37 displays a menu of files for uploading to the data storage apparatus 10 and uploads data such as a file to the data storage apparatus 10.

For example, data may be uploaded to the data storage apparatus 10 by reading a QR code indicated on the MFP 13, scanning data with the MFP 13, and uploading the scanned data to the data storage apparatus 10. In another example, data may be uploaded to the data storage apparatus 10 by uploading data from the portable terminal 400. In yet another example, data may be uploaded to the data storage apparatus 10 by taking a photograph with a camera function of the portable terminal 400 and uploading data of the photograph to the data storage apparatus 10.

In a case where the user selects a file from the list of files displayed by the file list display part 35, the preview display part 39 displays a preview of the file selected by the user. The preview display part 39 also displays a menu for performing a projecting process or a printing process. The projector management part 34 performs processes such as searching/registering the projector 14 and instructing the projector 14 to project the file selected by the user. The printing management part 33 performs processes such as searching/registering the MFP 13 and instructing the MFP 13 to print the file selected by the user.

In a case of reading a QR code with the portable terminal 400, the QR code read part 38 may use, for example, the preview display part 39, the setting data display part 36, and the screen display part 37. The QR code read by the QR code read part 38 includes, for example, a QR code to be registered for connecting the portable terminal 400 to the data storage apparatus 10, a QR code for identifying (designating) the MFP 13 that is to perform a printing process or a scanning process, or a QR code for identifying (designating) the projector 14 that is to perform a projecting process.

<Details of Processes>

Next, the processes performed by the input/output system 1 according to an embodiment of the present invention are described in further detail.

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<<Scanning to Projecting Via Smartphone>>

In this embodiment, a sequence of processes of the input/output system 1 is performed by scanning data with the MFP 13 and projecting the scanned data with the projector 14 via the smartphone 11. FIG. 6 is a sequence diagram illustrating processes performed by the input/output system 1 according to an embodiment of the present invention.

First, the user operates the MFP 13 and requests the MFP 13 to display a QR code screen (Step S1). In a case where displaying of the QR code screen is requested by the user, the MFP 13 sends a request for a QR code screen to the data storage apparatus 10 to obtain a QR code screen (Step S2). Further, the MFP 13 sends a request for a QR code to the data storage apparatus 10 to obtain a QR code (Step S3). Thereby, the MFP 13 displays the QR code screen including the QR code.

The QR code displayed in the QR code screen includes, for example, an IP address of the data storage apparatus 10 that generated the QR code, an IP address of the MFP 13 that displays the QR code, and capability data of a target electronic device (e.g., capability data of the MFP 13). The capability data of the target electronic device indicates a process that can be performed by the target electronic device. For example, the capability data of the target electronic device indicate whether a printing process can be performed, whether a projecting process can be performed, or whether a scanning process can be performed. In a case of providing a scanning service with the target electronic device, the QR code includes data indicating that the target electronic device includes a scanning function.

Then, the user operates the smartphone 11 and requests the smartphone 11 to display an upload screen for setting an upload destination (Step S4). FIG. 7 is a schematic diagram illustrating an example of the upload screen. When the user presses an upload destination setting button 1001 displayed on the upload screen, the smartphone 11 sends a request for a folder list (list of folders to which data can be uploaded) to the data storage apparatus 10 to obtain a folder list (Step S5). The smartphone 11 displays a folder selection screen as illustrated in, for example, FIG. 8. FIG. 8 is a schematic diagram illustrating an example of the folder selection screen.

Then, the user operates the smartphone 11 to select a folder as an upload destination from the folders in the folder list displayed in the folder selection screen of FIG. 8 (Step S6). Then, the user presses a "set scanning (set reading)" button 1002 displayed in the upload screen of FIG. 7 (Step S7). When the "set scanning" button 1002 is pressed, the smartphone 11 displays a scan (read) setting screen as illustrated in FIG. 9.

FIG. 9 is a schematic diagram illustrating an example of the scan setting screen. The user operates the smartphone 11 to set scan conditions by way of the scan setting screen. Scan conditions that can be set are, for example, document type, resolution, document side, document set direction, blank paper removal, document set position, file format, and double-side printing last page.

While the QR code screen (including the QR code) is being displayed by the MFP 13, the MFP 13 performs polling with respect to the data storage apparatus 10 for inquiring whether a scanning process has been requested by using the QR code (Step S8). The process of inquiring whether scanning has been requested is a background process of the MFP. In a case where the scanning process has not yet been requested, a "no scan request" is returned from the data storage apparatus 10 in response to the MFP's inquiry in Step S8.

It is to be noted that the order for performing the process of displaying the QR code screen including Steps S1-S3, the

process of selecting the folder of the upload destination including Step S4-S6, and the process of setting the scan conditions including Step S7 is merely an example and may be arbitrarily changed.

Then, the user operates the smartphone **11** and selects “scan by using a QR code” by pressing a “designate MFP with QR code” button **1003** displayed on the upload screen of FIG. 7 (Step S9).

When the “designate MFP with QR code” button **1003** is pressed, the smartphone **11** displays a QR code read screen as illustrated in FIG. 10. FIG. 10 is a schematic diagram illustrating an example of the QR code read screen. The QR code read screen includes a QR code display area **1101**. In this embodiment, the QR code display area **1101** is an area from which an image taken (obtained) by the camera function of the smartphone **11** is displayed.

Then, the user uses the camera function of the smartphone **11** to obtain an image of the QR code displayed on the QR code screen of the MFP **13** (Step S10). The user adjusts the position between the QR code displayed on the QR code screen and the smartphone **11**, so that the image of the QR code obtained with the camera function of the smartphone **11** can be displayed in the QR code display area **1101** of the QR code read screen.

By obtaining the image of the QR code, the smartphone **11** reads the QR code displayed on the QR code screen of the MFP **13**. As mentioned above, the read QR code includes the IP address of the data storage apparatus **10** which is to be the destination for transmitting scanned data, the IP address of the MFP **13** which is the source for transmitting the scanned data, and capability data of the MFP **13**.

The smartphone **11** determines whether the capability data of the MFP **13** obtained from the QR code includes a scanning function selected by the user in Step S9. For example, in a case where the user selects a scanning function by pressing “scan by using a QR code”, the smartphone **11** determines whether the capability data of the MFP **13** obtained from the QR code includes data indicating that the MFP **13** has a scanning function.

In a case where the QR code includes data indicating that the MFP **13** includes a scanning function, the smartphone **11** proceeds to a subsequent process (in this embodiment, a process of requesting a scanning process). In this case, the smartphone **11** may display the QR code read screen as illustrated in FIG. 11 for informing the user that the target electronic device (MFP **13**) has a scanning function and that the scanning process can be performed. FIG. 11 is a schematic diagram illustrating an example of the QR code read screen in a case where the MFP **13** has a scanning function.

In a case where the QR code does not include data indicating that the MFP **13** includes a scanning function, the smartphone **11** indicates an error on the QR code read screen as illustrated in FIG. 12 and terminates displaying the QR code read screen. FIG. 12 is a schematic diagram illustrating an example of the QR code read screen in a case where the MFP **13** does not have a scanning function. Alternatively, after displaying the QR code read screen as illustrated in FIG. 12, the smartphone **11** may display the QR code read screen of FIG. 10 again and continue displaying the QR code read screen until the smartphone **11** determines that a QR code includes data indicating that the MFP **13** includes a scanning function.

Then, the smartphone **11** uses the IP address of the data storage apparatus **10** which is to be the destination for transmitting scanned data and transmits a scan request to the data storage apparatus **11** (Step S11). The scan request includes

data pertaining to the folder to which data is uploaded and data pertaining to the scan conditions.

Similar to Step S8, the MFP **13** performs polling with respect to the data storage apparatus **10** for inquiring whether a scanning process has been requested by using the QR code (Step S12). In this case, a response indicating a scan request is returned from the data storage apparatus **10** in response to the MFP’s inquiry. In addition to the response from the data storage apparatus, the data pertaining to the folder to which data is uploaded and the data pertaining to the scan conditions are also transmitted to the MFP **13**. Then, the MFP **13** executes a scanning process in accordance with the scan conditions (Step S13). Then, the MFP **13** stores the scanned data in the folder of the data storage apparatus **10** selected as the upload destination (Step S14).

The processes performed in Steps S13 and S14 are repeated in correspondence with the number of pages of the scanned document. The scanned data becomes JPEG format data or TIFF format data depending on whether the scanned data is color or monochrome. After every page of the document has been scanned, the MFP **13** requests the data storage apparatus **10** to perform data conversion on the scanned data (Step S15).

The data storage apparatus **10** gathers (combines) all of the scanned data corresponding to each page into a single group of data and converts the scanned data into a scan file of a PDF format (Step S16). It is, however, to be noted that the scanned data may be converted into data formats other than the PDF format. The data format used to convert the scanned data in FIG. 16 may be, for example, a data format capable of combining all of the scanned data into a single group of data or a data format capable of being displayed with the smartphone **11**.

Then, the user operates the smartphone **11** and requests the smartphone **11** to display a main screen (see FIG. 13) for selecting a scan file (Step S17). FIG. 13 is a schematic diagram illustrating an example of the main screen.

In a case where the user has requested the smartphone **11** to display the main screen, the smartphone **11** obtains a file list by requesting the data storage apparatus **10** for the file list (Step S18). Then, the smartphone **11** displays the main screen including a file list **1201** as illustrated in FIG. 13 (Step S19).

In Step S19, the user operates the smartphone **11** and selects a file (in this embodiment, scan file) from the file list **1201** of FIG. 13. Then, the smartphone **11** obtains the scan file by requesting downloading of the file (scan file) selected by the user (Step S20).

As illustrated in FIG. 14, the smartphone **11** displays a preview of the scan file downloaded from the data storage apparatus **10** on the main screen. FIG. 14 is a schematic diagram illustrating an example of the preview displayed on the main screen.

Then, the user operates the smartphone **11** and selects “project by using QR code” (data output by projecting) by pressing a “designate projector with QR code” button **1211** displayed on the main screen of FIG. 14 (Step S21). When the “designate projector with QR code” button **1211** is pressed, the smartphone **11** displays a QR code read screen as illustrated in FIG. 15.

FIG. 15 is a schematic diagram illustrating an example of the QR code read screen. The QR code read screen includes a QR code display area **1301**. In this embodiment, the QR code display area **1301** is an area from which an image taken (obtained) by the camera function of the smartphone **11** is displayed.

Then, the user uses the camera function of the smartphone **11** to obtain an image of a QR code of the projector **14** (Step

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S22). For example, the QR code of the projector 14 may be indicated on an adhesive material adhered to a casing of the projector 14. Alternatively, the QR code of the projector 14 may be indicated on a projection screen. Alternatively, in a case where there is a display panel, the QR code of the projector 14 may be indicated on the display panel.

The user adjusts the position between the QR code of the projector 14 and the smartphone 11, so that the image of the QR code obtained with the camera function of the smartphone 11 can be displayed in the QR code display area 1301 of the QR code read screen.

By obtaining the image of the QR code, the smartphone 11 reads the QR code of the projector 14. As mentioned above, the read QR code includes the IP address of the projector 14 which is to project the scan file and capability data of the projector 14.

The smartphone 11 determines whether the capability data of the projector 14 obtained from the QR code includes a projecting function. That is, the smartphone 11 determines whether the capability data of the projector 14 obtained from the QR code includes data indicating that the projector 14 has a projecting function.

In a case where the QR code includes data indicating that the projector 14 includes a projecting function, the smartphone 11 proceeds to a subsequent process (in this embodiment, a process of requesting a projecting process). On the other hand, in a case where the QR code does not include data indicating that the projector 14 includes a projecting function, the smartphone 11 indicates an error on the QR code read screen and terminates displaying the QR code read screen. Alternatively, after displaying the error on the QR code read screen, the smartphone 11 may display the QR code read screen of FIG. 15 again and continue displaying the QR code read screen until the smartphone 11 determines that a QR code includes data indicating that the projector 14 includes a projecting function. Similar to the scanning service, in the case where the QR code includes data indicating that the projector 14 includes a projecting function, the smartphone 11 may display the QR code read screen as illustrated in FIG. 11 for informing the user that the target electronic device (projector 14) has a projecting function and that the scanning process can be performed. Further, in the case where the QR code does not include data indicating that the projector 14 includes a projecting function, the smartphone 11 indicates an error on the QR code read screen similar to that of FIG. 12.

Then, the smartphone 11 converts the scan file of the PDF format obtained in Step S20 into a file for projection (Step S23). In this embodiment, the data format of the scan file converted in Step S23 is a JPEG format. It is, however, to be noted that the scan file may be converted into data formats other than the JPEG format. The data format that is converted in Step S23 may be, for example, a data format that can be projected by the projector 14.

Then, the smartphone 11 transmits the file for projection (hereinafter also referred to as "projection file") to the projector 14 (Step S24). Then, the projector 14 executes a process of projecting the projection file received from the smartphone 11 (Step S25).

Accordingly, by performing the processes illustrated in the sequence diagram of FIG. 6, the MFP 13 for scanning data and the projector 14 for projecting data can easily cooperate with each other. Although the user explicitly selects data input by scanning in Step S9 of the sequence diagram of FIG. 6, whether to perform data input by scanning may be determined according to function data included in the QR code of the MFP 13.

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Further, although the user explicitly selects "data output by projecting" in Step S21 of the sequence diagram of FIG. 6, whether to perform data output by projecting may be determined according to function data included in the QR code of the projector 14.

Further, after Step S10 of the sequence diagram of FIG. 6, an error may be determined depending on whether a function explicitly selected by the user is included in the functions of the function data included in the QR code of the MFP 13. For example, the smartphone 11 may determine that the function explicitly selected by the user in Step S9 is an error when the function explicitly selected by the user is not included in the functions of the function data included in the QR code of the MFP 13.

Further, after Step S22 of the sequence diagram of FIG. 6, an error may be determined depending on whether a function explicitly selected by the user is included in the functions of the function data included in the QR code of the projector 14. For example, the smartphone 11 may determine that the function explicitly selected by the user in Step S21 is an error when the function explicitly selected by the user is not included in the functions of the function data included in the QR code of the projector 14.

<<Scanning to Printing Via Smartphone>>

In this embodiment, a sequence of processes of the input/output system 1 is performed by scanning data with the MFP 13 and printing the scanned data with an MFP 13a via the smartphone 11. FIG. 16 is a sequence diagram illustrating processes performed by the input/output system 1 according to another embodiment of the present invention. It is to be noted that the sequence diagram of FIG. 16 is substantially the same as the sequence diagram of FIG. 6 except for a portion of the sequence diagram of FIG. 16. Therefore, explanation of like processes between the sequence diagram of FIG. 6 and the sequence diagram of FIG. 16 is omitted.

The processes of Steps S51-S57 of FIG. 16 are substantially the same as the processes of Steps S1-S7 of FIG. 6. Therefore, further explanation of the processes of Steps S51-S57 of FIG. 16 is omitted. Then, the user operates the smartphone 11 and selects "scan by using a QR code" by pressing a "designate MFP with QR code" button 1003 displayed on the upload screen of FIG. 7 (Step S59).

When the "designate MFP with QR code" button 1003 is pressed, the smartphone 11 displays a QR code read screen as illustrated in FIG. 10. Then, the user uses the camera function of the smartphone 11 to obtain an image of the QR code displayed on the QR code screen of the MFP 13 (Step S60). By obtaining the image of the QR code, the smartphone 11 reads the QR code displayed on the QR code screen of the MFP 13.

Then, the smartphone 11 uses the IP address of the MFP 13 which is to be the source for transmitting scanned data and transmits a scan request to the MFP 13 (Step S61). The scan request includes data pertaining to the folder to which data is uploaded and data pertaining to the scan conditions. In the sequence diagram of FIG. 15, the MFP 13 does not perform polling with respect to the data storage apparatus 10 for inquiring whether a scanning process has been requested by using the QR code. Instead of transmitting a scan request to the data storage apparatus 10, the smartphone 11 transmits a scan request to the MFP 13.

The processes of Steps S62-S69 of FIG. 16 are substantially the same as the processes of Steps S13-S20 of FIG. 6. Therefore, further explanation of the processes of Steps S62-S69 of FIG. 16 is omitted. Then, the user operates the smartphone 11 and selects "MFP printing by using QR code" by pressing a "designate MFP with QR code" button 1401 dis-

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played on the main screen of FIG. 17 (Step S70). When the “designate MFP with QR code” button 1401 is pressed, the smartphone 11 displays a QR code read screen as illustrated in FIG. 18.

FIG. 18 is a schematic diagram illustrating an example of the QR code read screen. The QR code read screen includes a QR code display area 1501. In this embodiment, the QR code display area 1501 is an area from which an image taken (obtained) by the camera function of the smartphone 11 is displayed.

Then, the user uses the camera function of the smartphone 11 to obtain an image of a QR code of the MFP 13a (Step S71). For example, the QR code of the MFP 13a may be indicated on an adhesive material adhered to a casing of the MFP 13a. Alternatively, the QR code of the MFP 13a may be indicated on an operation panel of MFP 13a. The user adjusts the position between the QR code of the MFP 13a and the smartphone 11, so that the image of the QR code obtained with the camera function of the smartphone 11 can be displayed in the QR code display area 1501 of the QR code read screen. By obtaining the image of the QR code, the smartphone 11 reads the QR code of the MFP 13a which includes an IP address of the MFP 13a.

Then, the smartphone 11 request the data storage apparatus 10 to perform data conversion on the scan file (in this embodiment, scan file of PDF format) selected in Step S68 (Step S72). Then, the data storage apparatus 10 converts the scan file into a file of a format used for printing (hereinafter also referred to as “printing file”) (Step S73). In this embodiment, the format of the printing file is an RPCS format. It is, however, to be noted that the scan file may be converted into data formats other than the RPCS format. The data format used to convert the scan file may be, for example, a data format that allows the MFP 13a to print the scan file.

The data storage apparatus 10 transmits the converted data (printing file) to the smartphone 11. Then, the smartphone 11 transmits the printing file to the MFP 13a (Step S74). Then, the MFP 13a prints the printing file (Step S75).

Accordingly, by performing the processes illustrated in the sequence diagram of FIG. 16, the MFP 13 for scanning data and the MFP 13a for printing data can easily cooperate with each other. Although different MFPS are used for performing the scanning process and the printing process (i.e. MFP 13 and MFP 13a), the same MFP may be used for performing the scanning process and the printing process.

Although the user explicitly selects data output by printing in Step S70 of the sequence diagram of FIG. 16, whether to perform data output by printing may be determined according to function data included in the QR code of the MFP 13a.

Further, after Step S71 of the sequence diagram of FIG. 16, an error may be determined depending on whether a function explicitly selected by the user is included in the functions of the function data included in the QR code of the MFP 13a.

Further, similar to the sequence diagram of FIG. 6, the smartphone 11 may transmits a scan request to the data storage apparatus 10, and the MFP 13 may perform polling with respect to the data storage apparatus 10 for inquiring whether a scanning process has been requested.

<<Scanning to Projecting not Via Smartphone>>

In this embodiment, a sequence of processes of the input/output system 1 is performed by scanning data with the MFP 13 and projecting the scanned data with the projector 14 without the intervening of the smartphone 11. FIG. 19 is a sequence diagram illustrating processes performed by the input/output system 1 according to yet another embodiment of the present invention. The sequence diagram of FIG. 19 is substantially the same as the sequence diagram of FIG. 6

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except for a portion of the sequence diagram of FIG. 19. Therefore, explanation of like processes between the sequence diagram of FIG. 6 and the sequence diagram of FIG. 19 is omitted.

The processes of Steps S101-S122 of FIG. 19 are substantially the same as the processes of Steps S1-S22 of FIG. 6. Therefore, further explanation of the processes of Steps S101-S122 of FIG. 19 is omitted. Then, the smartphone 11 sends a request for projection of the scan file selected in Step S119 to the data storage apparatus 10 (Step S123). Then, the data storage apparatus 10 converts the scan file of the PDF format into a file for projection (Step S124). In this embodiment, the data format of the converted scan file in Step S124 is a JPEG format. It is, however, to be noted that the scan file may be converted into data formats other than the JPEG format. The data format that is converted in Step S124 may be, for example, a data format that can be projected by the projector 14.

Then, the data storage apparatus 10 transmits the file for projection (hereinafter also referred to as “projection file”) to the projector 14 (Step S125). Then, the projector 14 executes a process of projecting the projection file received from the data storage apparatus 10 (Step S126).

Accordingly, by performing the processes illustrated in the sequence diagram of FIG. 19, the MFP 13 for scanning data and the projector 14 for projecting data can easily cooperate with each other. Similar to the sequence diagram of FIG. 16, the MFP 13 need not perform polling with respect to the data storage apparatus 10 for inquiring whether a scanning process has been requested. Instead of transmitting a scan request to the data storage apparatus 10, the smartphone 11 may transmit a scan request to the MFP 13.

<<Other Processes of Input/Output System>>

According to an embodiment of the present invention, the processes of the sequence diagrams of FIG. 6, FIG. 16, and FIG. 19 may be combined, so that the input/output system 1 may arbitrarily perform the combined processes. For example, although the smartphone 11 performs the process of converting the scan file of the PDF format into the projection file of the JPEG format in the sequence diagram of FIG. 6, the data storage apparatus 10 may perform the process of converting the scan file of the PDF format into the projection file of the JPEG format as illustrated in the sequence diagram of FIG. 19.

Similarly, although the data storage apparatus 10 performs the process of converting the scan file of the PDF format into the printing file of the RPCS format in the sequence diagram of FIG. 16, the smartphone 11 may perform the process of converting the scan file of the PDF format into the printing file of the RPCS format as illustrated in the sequence diagram of FIG. 6.

Further, although the printing data is printed by the MFP 13a via the smartphone 11 in the sequence diagram of FIG. 16, the data storage apparatus 10 may directly transmit the printing data to the MFP 13a instead of transmitting the printing data by way of the smartphone 11.

<Conclusion>

With the above-described embodiments of the input/output system 1, the user can obtain data that identifies a target electronic device (e.g., QR code) by holding a portable terminal (e.g., smartphone 11, tablet terminal 12) over or near an electronic device (e.g., MFP 13, projector 14). The user can easily select an electronic device for inputting or outputting electronic data from multiple electronic devices.

Thus, with the above-described embodiments of the input/output system 1, one or more electronic devices can be controlled by having a portable terminal and a data processing

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apparatus (e.g., data storage apparatus **10**) cooperatively operated by the user. Thereby, various services can be provided by the input/output system **1**.

The present invention is not limited to the specifically disclosed embodiments, and variations and modifications may be made without departing from the scope of the present invention.

The present application is based on and claims the benefit of priority of Japanese Priority Application Nos. 2013-043889 and 2014-031706 filed on Mar. 6, 2013 and Feb. 21, 2014, respectively, with the Japanese Patent Office, the entire contents of which are hereby incorporated by reference.

What is claimed is:

1. A service providing system for providing multiple services by using one or more electronic devices connected to the service providing system, the system comprising:

a data processing apparatus; and

a portable terminal including

a receiving part configured to receive a selection of a target service included in the multiple services, the target service including a service for inputting electronic data from a target electronic device included in the one or more electronic devices to the data processing apparatus, and a service for outputting electronic data of the data processing apparatus to the target electronic device;

an obtaining unit configured to obtain device data from the target electronic device, the device data identifying the one or more electronic devices, after the selection of the target service is received;

a determining part configured to determine whether the target service can be executed by the target electronic device according to the device data obtained from the target electronic device;

a first transmitting unit configured to transmit a request to execute the target service to the data processing apparatus in a case where the determining part determines that the target service can be executed by the target electronic device and the target service is a service of inputting electronic data from the one or more electronic devices to the data processing apparatus, and configured transmit a request to obtain electronic data output from the data processing apparatus in a case where the determining part determines that the target service can be executed by the target electronic device and the target service is a service of outputting electronic data stored in the data processing apparatus; and

a controlling unit configured to control the one or more electronic devices to output electronic data transmitted from the data processing apparatus in a case where the determining part determines that the target service can be executed by the target electronic device and the target service is a service of outputting electronic data stored in the data processing apparatus from the one or more electronic devices;

wherein the data processing apparatus includes

a storage unit configured to store electronic data;

a requesting unit configured to request the one or more electronic devices to execute a process of inputting electronic data in response to the request to execute the target service transmitted from the portable terminal;

a storage control unit configured to control the storage unit to store the electronic data transmitted from the one or more electronic devices in response to a request from the requesting unit; and

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a second transmitting unit configured to transmit the electronic data stored in the storage unit to the portable terminal in response to a request to obtain electronic data transmitted from the portable terminal.

2. The service providing system as claimed in claim **1**, wherein the device data includes connection data for connecting with the one or more electronic devices and capability data indicating a process that can be executed by the one or more electronic devices,

wherein the determining part is configured to determine whether the target service can be executed by the target electronic device according to the capability data included in the device data obtained from the target electronic device,

in a case where the determining part determines that the target service can be executed by the target electronic device, the portable terminal and the data processing apparatus are configured to connect with the target electronic device based on the connection data, cooperate with each other, and control the target electronic device for providing the target service.

3. The service providing system as claimed in claim **1**, wherein the one or more electronic devices include an image forming apparatus and a projector,

wherein the receiving part is configured to receive a selection of one of a service for printing electronic data stored in the data processing apparatus and a service for projecting the electronic data stored in the data processing apparatus,

wherein in a case where the selection received by the receiving part is the service for projecting the electronic data, the determining part is configured to determine that the service for projecting the electronic data cannot be executed by the target electronic device if the one or more electronic devices identified by the device data is the image forming apparatus.

4. The service providing system as claimed in claim **1**, wherein the one or more electronic devices include an image forming apparatus and a projector,

wherein in a case where the selection received by the receiving part is the service for inputting the electronic data, the determining part is configured to determine that the service for inputting the electronic data cannot be executed by the target electronic device if the one or more electronic devices identified by the device data is the projector.

5. The service providing system as claimed in claim **1**, wherein the device data includes connection data for connecting with the data processing apparatus,

wherein the service for inputting the electronic data includes a process for storing the electronic data in the storage unit based on connection data included in the device data.

6. The service providing system as claimed in claim **1**, wherein the portable terminal includes a displaying part, wherein in a case where the determining part determines that the target service can be executed, the displaying part is configured to display that the target service can be executed,

wherein in a case where the determining part determines that the target service cannot be executed, the displaying part is configured to display that the target service cannot be executed,

wherein in the case where the determining part determines that the target service cannot be executed, the service providing system does not provide the target service.

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7. The service providing system as claimed in claim 1, wherein the portable terminal includes a camera function, wherein the obtaining unit is configured to obtain the device data from image data obtained from the camera function of the portable terminal.

8. A method for providing multiple services by using one or more electronic devices connected to a service providing system including a data processing apparatus and a portable terminal, the method comprising the steps of:

receiving a selection of a target service included in the multiple services, the target service including a service for inputting electronic data from a target electronic device included in the one or more electronic devices to the data processing apparatus, and a service for outputting electronic data of the data processing apparatus to the target electronic device;

obtaining device data from the target electronic device included in the one or more electronic devices, the device data identifying the one or more electronic devices, after the selection of the target service is received;

determining whether the target service can be executed by the target electronic device according to the device data obtained from the target electronic device;

transmitting a request to execute the target service to the data processing apparatus in a case where the target electronic device is determined to be capable of executing the target service in the determining step and the target service is a service of inputting electronic data from the one or more electronic devices to the data processing apparatus, and transmitting a request to obtain electronic data output from the data processing apparatus in a case where the determining step determines that the target service can be executed by the target electronic device and the target service is a service of outputting electronic data stored in the data processing apparatus;

controlling the one or more electronic devices to output electronic data transmitted from the data processing apparatus in a case where the determining step determines that the target service can be executed by the target electronic device and the target service is a service of outputting electronic data stored in the data processing apparatus from the one or more electronic devices;

storing electronic data in a storage unit of the data processing apparatus;

requesting the one or more electronic devices to execute a process of inputting electronic data in response to the request to execute the target service transmitted from the portable terminal;

controlling the storage unit to store the electronic data transmitted from the one or more electronic devices in response to a request from the requesting step; and

transmitting the electronic data stored in the storage unit to the portable terminal in response to a request to obtain electronic data transmitted from the portable terminal.

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9. A terminal device included in a service providing system for providing multiple services by using one or more electronic devices connected to the service providing system that includes a data processing apparatus and a portable terminal, the terminal device comprising:

a receiving part configured to receive a selection of a target service included in the multiple services, the target service including a service for inputting electronic data from a target electronic device included in the one or more electronic devices to the data processing apparatus, and a service for outputting electronic data of the data processing apparatus to the target electronic device; an obtaining unit configured to obtain device data from the target electronic device included in the one or more electronic devices, the device data identifying the one or more electronic devices, after the selection of the target service is received;

a determining part configured to determine whether the target service can be executed by the target electronic device according to the device data obtained from the target electronic device;

a first transmitting unit configured to transmit a request to execute the target service to the data processing apparatus in a case where the determining part determines that the target service can be executed by the target electronic device and the target service is a service of inputting electronic data from the one or more electronic devices to the data processing apparatus, and configured to transmit a request to obtain electronic data output from the data processing apparatus in a case where the determining part determines that the target service can be executed by the target electronic device and the target service is a service of outputting electronic data stored in the data processing apparatus; and

a controlling unit configured to control the one or more electronic devices to output electronic data transmitted from the data processing apparatus in a case where the determining part determines that the target service can be executed by the target electronic device and the target service is a service of outputting electronic data stored in the data processing apparatus from the one or more electronic devices;

wherein the data processing apparatus includes

a storage unit configured to store electronic data;

a requesting unit configured to request the one or more electronic devices to execute a process of inputting electronic data in response to the request to execute the target service transmitted from the terminal device;

a storage control unit configured to control the storage unit to store the electronic data transmitted from the one or more electronic devices in response to a request from the requesting unit; and

a second transmitting unit configured to transmit the electronic data stored in the storage unit to the terminal device in response to a request to obtain electronic data transmitted from the terminal device.

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